03.10-4/15/86-00691

ESE

AN R&H COMPANY

ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.

April 15, 1986

ESE No. 85 275 1000

Ms. Cherryl Barnett
Department of the Navy
Atlantic Division, Code 1143
Naval Facilities Engineering Command
Building IIA, Gilbert Street
Norfolk, Virginia 23511

RE: Contract No. N62740-85-B-7972, Confirmation Study, U.S.Naval Complex, Puerto Rico

Dear Ms. Barnett:

Enclosed is the progress report for the period of March 16, 1986 through April 15, 1986.

Please do not hesitate to call me if you have any questions regarding this report.

Sincerely,

Russell V. Bowen, P.E.
Project Manager

RVB/njb

enclosure

cc: J. Vardy, NAVFAC
Lou Bilello, ESE
Lisa Bare, ESE
Bill Coulombe, ESE

MONTHLY PROGRESS REPORT

PERIOD 3/16/86 THROUGH 4/15/86

U.S. NAVAL COMPLEX, PUERTO RICO
CONFIRMATION STUDY

WORK ACCOMPLISHED

1. Completed laboratory analyses as shown in Table 1, and continued analyses of remaining samples. A brief discussion of the analytical data is presented in Attachment 1.

2. Completed collection of all environmental samples, except ground water sample from Site 3, NAF Vieques.

3. Continued preparation of Performance Work Statement (PWS) for drum and gas cylinder removal operations at Sites 6, 7, 10, 11, and 16 at NAVSTA Roosevelt Roads.

PROBLEMS ENCOUNTERED

Collection of a ground water sample from well 3PW01 at Site 3, NAF Vieques, requires cutting of the riser pipe, and repeated attempts to contact the civilian personnel on Vieques with the authority to approve cutting of the riser pipe were unsuccessful. Furthermore, all other field investigations had been completed by the end of March 1986, and leaving the field crew in Puerto Rico an additional week to obtain the approval to cut the riser pipe and sample the well would not have been cost effective.

PERCENTAGE OF WORK COMPLETED

Approximately 94 percent.

PLANS FOR FOLLOWING MONTH

1. Complete surveying of all monitor wells.

2. Continue laboratory analyses of samples.

3. Complete PWS for the drum and gas cylinder removal operations and forward the PWS to the EIC.

4. Complete draft report for Round 1 of the Verification Step, including recommendations for additional monitoring for Round 2.

CONFIRMATION OF ANY CLARIFICATIONS OR TECHNICAL GUIDANCE

In accordance with the telephone conversation between Russ Bowen (ESE Project Manager) and Cherryl Barnett (EIC) on 28 March 1986, well 3 PW01 at Site 3, NAF Vieques, will not be sampled during the Round 1 sampling and analysis program for the reason described above under "PROBLEMS ENCOUNTERED". Rather, this well will be sampled during Round 2.

Table 1. Confirmation Study - U.S. Naval Complex, Puerto Rico - Laboratory Analyses Completed as of 3/30/86

Site	Type of Sample*	Completed Analyses
NAF Vieques		
1	GW	pH, 67 percent (2 of 3 samples) of EDB, total chromium, and lead
	SE, S	pH, percent moisture, oil and grease, VOA, xylene, MEK, MIBK, EDB, total chromium, lead
2	SW	pH, total and hexavalent chromium, lead, VOA, xylene, MEK, MIBK
	SE	pH, percent moisture, lead, total chromium, VOA, xylene, MEK, MIBK
	S	pH, percent moisture, lead, total chromium, VOA, xylene, MEK, MIBK
NAVSTA Roosevelt Roads		
5	SW	pH, Priority Pollutant scan, hexavalent chromium, xylene, MEK, MIBK
	GW	pH; metals, phenols, base neutrals and 80 percent (4 of 5 samples) of volatiles fractions of Priority Pollutant scan; 80 percent of xylene, MEK and MIBK, EDB
	SE	pH, percent moisture, xylene, MEK, MIBK, EDB, Priority Pollutant scan
6	SW	pH, Priority Pollutant scan, hexavalent chromium, xylene, MEK, MIBK
	SE	pH, percent moisture, Priority Pollutant scan, xylene, MEK, MIBK, EDB
	S	pH, percent moisture, EDB, Priority Pollutant scan [except for 60 percent (9 of 15 samples) of volatiles fractions], 40 percent (6 of 15 samples) of xylene, MEK, and MIBK

7	GW	pH; metals, phenolics, and base neutrals fractions of Priority Pollutant scan; hexavalent chromium
	S	percent moisture, oil and grease, EDB, and 50 percent of MEK, MIBK, xylene, and VOA (1 of 2 soil samples collected)
8	SW, SE, S	percent moisture, oil and grease, lead, VOA, xylene, MEK, MIBK, EDB
9	SW	PCBs
	SE	percent moisture, PCBs
10	GW	pH; metals, volatiles, phenolics, base neutrals and 75 percent of pesticides and PCBs fractions of Priority Pollutant scan; hexavalent chromium; xylene; MEK; MIBK; EDB
12	SW	pH, EDB, oil and grease, lead
	GW	pH, EDB, oil and grease, 33 percent (2 of 6 samples)of VOA, xylene, and lead
	SE	pH, VOA, EDB, xylene, oil and grease, lead
	S	EP toxicity test metals
13	SW	pH, VOA, lead, oil and grease, EDB, xylene
	GW	pH, lead, EDB, 64 percent (7 of 11 samples) of VOA and xylene, 82 percent (9 of 11 samples) of oil and grease
	SE	percent moisture, pH, VOA, lead, oil and grease, EDB, xylene
14	SW	pH, oil and grease, EDB, lead, and 42 percent (5 of 12 samples) of VOA, xylene, MEK, and MIBK
	SE	pH, percent moisture, oil and grease, lead, EDB, VOA, xylene, MEK, MIBK
15	S	percent moisture, PCBs
16	S	percent moisture, oil and grease, lead, EDB, PCBs, and 44 percent (4 of 9 samples) of VOA, xylene, MEK, and MIBK

18	SW	pesticides
	SE	percent moisture, pesticides
	S	percent moisture, pesticides

NSGA Sabana Seca

6	SE	percent moisture, pesticides
	S	percent moisture, pesticides
7	SW	pH, Priority Pollutant scan (except for volatiles fractions)
	GW	pH, 33 percent (2 of 6 samples) of phenolics and base neutrals fractions and 33 percent of metals fractions (except mercury) of Priority Pollutant scan.
	SE	pH; percent moisture; metals, phenolics and base neutrals fractions of Priority Pollutant scan

*SW = surface water
GW = ground water
SE = sediment
S = soil

ATTACHMENT 1

PRELIMINARY EVALUATION OF DATA AVAILABLE AS OF 3/30/86

CONFIRMATION STUDY, U.S. NAVAL COMPLEX, PUERTO RICO

NAF VIEQUES

SITE 1 QUEBRADA DISPOSAL SITE

No significant contamination was detected in any of the soil and sediment samples collected at Site 1. The available data base for the ground water samples shows elevated levels of total chromium. However, lead and EDB were not detected in these ground water samples.

SITE 2, MANGROVE DISPOSAL SITE, VIEQUES

No contamination was detected in any of the surface water samples collected at Site 2 (except for traces of total chromium, ranging from 3.0 to 4.0 ug/L found in samples SW1-SW5); no violations of EPA water quality criteria were indicated. In addition, the concentrations of lead and total chromium in the sediment and soil samples collected at this site do not indicate significant contamination. Furthermore, the data base for the soil samples shows that no volatile organic compounds, xylene, MEK, or MIBK were detected.

NAVSTA ROOSEVELT ROADS

SITE 5, ARMY CREMATOR DISPOSAL AREA

The available data base for the surface water samples collected at Site 5 indicates that BIS (2-ETH' HEX') PHTH and DI-N-OCTYL PHTHALATE were the only organic Priority Pollutants detected. BIS (2-ETH' HEX') PHTH was found in samples 5SW1 through 5SW3, and 5SW5 in concentrations ranging from 1 to 2 ug/L, which is far below the EPA water quality criterion of 15 mg/L for this compound, and the DI-N-OCTYL PHTHALATE concentrations ranged from 1 to 7 ug/L. In addition, the compounds MEK, MIBK, and xylene were not detected in any of the surface water samples. With regard to metals, the arsenic concentrations in the five samples collected at this site (96.0 to 105 ug/L) exceeded the EPA water quality criterion of 0.0022 ug/L. In addition, the thallium concentrations in the five samples (83.3 to 116 ug/L) exceeded the EPA water quality criterion of 13 ug/L. The nickel concentration for sample 5SW5 (33.6 ug/L) exceeded the EPA water quality criterion of 13.4 ug/L for nickel.

The data base for the sediment samples collected at Site 5 does not indicate the presence of any significant contamination.

The available data base for the ground water samples collected at Site 5 indicates that only four organic Priority Pollutants were detected. BIS (2-ETH'HEX')PHTH was found in samples 5GW1, 5GW2, 5GW4, and 5GW5 at concentrations ranging from 0.4 to 2 ug/L which is far below the EPA water quality criterion of 15 mg/L for this compound. Sample 5GW1 showed a trace of chloroform (0.54 ug/L). Pentachlorophenol was detected in samples 5 GW1, through 5GW4 at concentrations ranging from 11 to 25 ug/L which is far below the EPA water quality criterion 1.01 mg/L for this compound. A slight level of contamination was detected in sample 5GW1 for 1,1,2,2-TE'CH' ETHANE with a concentration of 1.1 ug/L. The EPA water quality criterion for this compound is 0.17 ug/L. With regard to metals, significant levels of arsenic were detected in samples 5GW1, 5GW3, 5GW4, and 5GW5. Sample 5GW4 showed a high level of beryllium (5.06 ug/L). A slight level of copper contamination was detected in sample 5GW3, as was nickel contamination in samples 5GW3 and 5GW4. Significant levels of thallium were found in samples 5GW3 through 5GW5. The available data base for xylene, MEK, MIBK, and EDB does not indicate the presence of any contamination.

SITE 6, LANGLEY DRIVE DISPOSAL SITE

The available data base for the surface water samples collected at Site 6 indicates that BIS (2-ETH' HEX') PHTH and DI-N-OCTYL PHTHALATE were the only organic Priority Pollutants detected, and only traces of these compounds were found (1 to 2 ug/L). BIS (2-ETH' HEX') PHTH was found in two samples (R6SW1 and R6SW2) at a concentration of 1 ug/L, well below the 15 mg/L EPA water quality criterion for this compound. In addition, the compounds xylene, MEK, and MIBK were not detected in any of the surface water samples. With regard to metals, the available data base indicates that the concentrations of beryllium, total chromium, lead, mercury, nickel, selenium, and thallium exceed the respective EPA water quality criteria for these metals.

The data base for the sediment samples collected at Site 6 showed only trace amounts of DI-N-OCTYL PHTHALATE, with concentrations ranging from 0.2 to 0.3 mg/kg, dry weight basis. Only one sample (R6SE1), showed a trace amount of BIS (2-E-H) PHTHALATE (0.09 mg/kg, dry weight basis).

The available data base for the soil samples shows the presence of several organic and inorganic Priority Pollutants. The concentrations of these pollutants indicate only a slight level of contamination. In addition, the data base for EDB, does not indicate the presence of any contamination. The available data base for xylene, MEK, and MIBK does not indicate the presence of any contamination.

SITE 7, STATION LANDFILL

The available data base for the ground water samples collected at Site 7 indicates that traces of several organic Priority Pollutants were detected. In all of the ground water samples at Site 7, BUTYL BENZ' PHTHALATE was found, with concentrations ranging from 0.3 to 17 ug/L, as was

BIS (2-ETH' HEX') PHTH, with concentrations ranging from 1 to 8 ug/L, which is far below the EPA water quality criterion of 15 mg/L for this compound. DI-N-BUTYLPHTHALATE was detected in samples R7GW1, R7GW2, R7GW4, R7GW5, R7GW7, and R7GW8 with concentrations ranging from 0.3 to 2 ug/L. Sample R7GW8 showed traces of 1,3-dichlorobenzene, 1,2-dichlorobenzene, and 1,4-dichlorobenzene. Sample R7GW4 also showed a trace of 1,4-dichlorobenzene. Sample R7GW5 showed a trace of diethylphthalate. DI-N-OCTYL PHTHALATE was found in samples R7GW1, R7GW2, R7GW7, and R7GW8. The concentrations ranged from 0.5 to 1 ug/L. With regard to metals, the arsenic concentrations in the eight samples from this site exceeded the EPA water quality criterion of 0.0022 ug/L. The concentrations ranged from 41.6 to 121 ug/L. The concentrations of beryllium (ranging from 4.16 to 11.3 ug/L) for samples R7GW1, R7GW6, R7GW7, and R7GW8 also exceeded the EPA water quality criterion (0.0037 ug/L for beryllium). Total chromium was present in sample R7GW8 at a concentration of 57.7 ug/L. Sample R7GW5 had a total lead concentration equal to 424 ug/L. Samples R7GW3 and R7GW8 had concentrations of nickel equal to 14.3 and 18.7 ug/L, respectively. The selenium concentration of R7GW6 (88.9 ug/L) exceeded the EPA water quality criterion of 10 ug/L. Elevated concentrations of thallium were found in samples R7GW1 through R7GW6. The concentrations ranged from 31.2 to 1780 ug/L.

The oil and grease data for the soil samples collected at Site 7 indicates only a slight level of contamination (80 to 198 ug/g, dry weight basis), and the available data base for volatile organic compounds, xylene, MEK, and MIBK does not indicate the presence of any contamination. In addition, EDB was not detected in either of the two soil samples collected at Site 7.

SITE 8, DRONE WASHDOWN

Although two of the surface water samples collected at Site 8 (8SW2 and 8SW3) showed a significant level of oil and grease contamination (98 to 102 mg/L), other analytes (volatile organic compounds, xylene, MEK, MIBK, and lead) were not detected in any of the surface water samples. Likewise, the data for the sediment samples collected at this site indicate a significant level of oil and grease contamination, with concentrations ranging from 787 to 4,740 ug/g, dry weight basis (787 to 4,740 ppm). However, no volatile organic compounds, xylene, MEK, MIBK, or EDB were detected in the sediment samples, and although lead was detected in two of the samples (8SE1 and 8SE3), the concentrations were not significant (28.8 and 43.4 ug/g, dry weight basis).

SITE 9, PCB DISPOSAL, DRY DOCK AREA

PCBs were not detected in the four surface water samples and thirty sediment samples collected at Site 9.

SITE 10, BUILDING 25 STORAGE AREA

The data base for the ground water samples collected at Site 10 indicates that no MIBK, xylene, or EDB were detected. MEK was detected in one ground water sample (10GW4) at a concentration of 9 ug/L. The available data base for the organic Priority Pollutants shows trace amounts

of BUTYL BENZ' PHTHALATE in the eight samples with concentrations ranging from 3 to 40 ug/L. In addition, the background ground water sample (10GW1) shows a trace amount of BIS(2-ETH'HEX') PHTH (3 ug/L). With regard to metals, concentrations of antimony, arsenic, beryllium, cadmium, total chromium, copper, lead, mercury, nickel, selenium, and thallium in the downgradient ground water sample exceeded the respective EPA water quality criteria. The concentrations of hexavalent chromium did not exceed EPA water quality criteria. However, the concentration of all of these metals, with the exception of antimony, copper, and lead, in the background ground water sample (10GW1) also exceeded the respective EPA water quality criteria.

SITE 12, TWO WAY ROAD FUEL FARM

Lead and EDB were not detected in the surface water sample collected at Site 12, and only a slight oil and grease concentration (0.4 mg/L) was detected in this sample. Similarly, oil and grease was detected in the sediment sample collected at this site at a concentration of 3,340 ug/g, dry weight basis, but all other analytes (VOA, EDB, xylene, and lead) were not detected.

The available data base for the ground water samples collected at Site 12 indicates a significant level of benzene contamination in sample 12GW2 (2000 ug/L). Toluene and ethylbenzene were also detected in sample 12GW2 but in concentrations less than the EPA water quality criteria for these compounds. The available data base indicates that lead and xylene were not detected in the ground water, and EDB was not detected in any of the six ground water samples collected from this site. Oil and grease concentrations ranged from 0.4 to 42 mg/L in the six ground water samples.

SITE 13, TANKS 210 TO 217

Volatile organic compounds, xylene, EDB, and lead were not detected in the surface water samples collected at Site 13, and only a slight level of oil and grease contamination (less than 1 mg/L) was detected in two of the six samples. However, significant oil and grease contamination was detected in the six sediment samples collected at this site, with concentrations ranging from 1,730 to 52,300 ug/g, dry weight basis. Although a moderate level of lead (400 ug/g, dry weight basis) was detected in one sediment sample (13SE1), lead was not found in appreciable concentrations in the other five samples, and EDB was not detected in any of the sediment samples.

In the available data base for the ground water samples collected at Site 13, several volatile organics were detected. The concentration of benzene ranged from 16 to 2000 ug/L in samples 13GW2, 13GW5, and 13GW9, which is well above the EPA water quality criterion of 0.66 ug/L for this compound. In sample 13GW3, bromodichloromethane was found at 0.57 ug/L. Chlorobenzene was detected in sample 13GW5 (1.5 ug/L). Elevated levels of chloroform ranging from 0.42 to 5.0 ug/L were found in samples 13GW1, 13GW3,

13GW5, 13GW6, and 13GW10. Sample 13GW2 showed a significant amount of 1,2-dichloroethane, (90 ug/L) which exceeds the EPA water quality criterion of 0.94 ug/L for this compound. Traces of ethylbenzene were found in samples 13GW2 and 13GW5. Sample 13GW2 showed moderate toluene contamination (34,000 ug/L); whereas 13GW5 showed only a trace of toluene. Vinyl chloride was detected in 13GW5 below the EPA water quality criterion of 2 ug/L. The available data shows that xylene was detected in 12GW2, 12GW3, 12GW5, and 12GW9 at concentrations ranging from 4.9 to 360 ug/L. EDB was found in samples 13GW2, 13GW3, and 13GW6. The available data indicates low levels of oil and grease contamination in samples 13GW1 through 13GW3 and 13GW6 through 13GW11 with concentrations ranging from 0.2 to 5 mg/L.

SITE 14, ENSENADA HONDA SHORELINE AND MANGROVES

Although eight of the twelve surface water samples collected at Site 14 had low levels of oil and grease (0.3 to 2.0 mg/L), EDB and lead were not detected in any of the surface water samples. Furthermore, the data base for volatile organic compounds, xylene, MEK, and MIBK shows that none of these analytes were detected.

Although moderate to high levels of oil and grease were found in several of the sediment samples collected at Site 14, EDB and lead were not detected in any of the sediment samples. In addition, the data base for volatile organic compounds, xylene, and MIBK shows that these compounds were not detected. MEK was detected in only one sample (14SE1) at a very low concentration (0.008 ug/g, dry weight basis).

SITE 15, SUBSTATION 2

PCBs were detected in seven of the eight discrete surficial soil samples (15S1A through 15S6A, and 15S8A) collected adjacent to Substation 2 in concentrations ranging from 2.38 to 308 ug/g, dry weight basis. No PCBs were detected in any of the soil samples collected in the storage yard located across the street from Substation 2.

SITE 16, OLD POWER PLANT, BUILDING 38

Moderate to high levels of oil and grease contamination (221 to 6,348 ug/g, dry weight basis) were found in the nine soil samples collected at Site 16, and significant lead concentrations were found in two of the samples (16S3A and 16S4A). EDB was not detected in any of the soil samples; however, PCBs were detected in seven of the nine soil samples (16S2A through 16S7A, and 16S9A), and the concentrations ranged from 3.39 to 404 ug/g, dry weight basis (3.39 to 404 ppm).

The available data base for volatile organic compounds, MIBK, and xylene indicates the absence of contamination relative to these analytes, and although MEK was detected in two samples (16S4A and 16S9A), the MEK concentration in both samples was only 1 ug/g, dry weight basis.

SITE 18, PEST CONTROL SHOP

Chlordane was the only pesticide detected in both surface water samples collected at this site. Although both concentrations were less than 1 ug/L, they both exceeded the EPA water quality criterion of 0.00046 ug/L. In the two sediment samples collected at this site; DDE, PP′; dieldrin; endosulfan, A; and endosulfan, B were detected but at low concentrations (less than 8 ug/g, dry weight basis).

The available data base for the five discrete and 10 composite surficial soil samples collected at this site show that no pesticides were detected in the drainage ditch located to the west of the former pest control shop (Samples 18S1A, 18S2A, and 18S3A). However, low levels (less than 5 ug/g, dry weight basis) of DDE, PP′; dieldrin; and endosulfan sulfate were found in the drainage ditch located east of the former pest control shop (Samples 18S4A and 18S5A). In addition, low levels (less than or equal to 4 ug/g, dry weight basis) of numerous pesticides (aldrin; DDD, PP′; DEE, PP′; dieldrin; endosulfan, A; endosulfan sulfate; endrin; heptachlor; and heptachlor epoxide) were found in the ten composite soil samples collected in the area surrounding the former pest control shop, except for sample 18S14C which had a DDT, PP′ concentration of 167 ug/g, dry weight basis.

NSGA SABANA SECA

SITE 6, FORMER PEST CONTROL SHOP

Chlordane was the only pesticide detected in both sediment samples collected at this site with concentrations of 88.5 ug/g and 5.69 ug/L, dry weight basis. Trace amounts of aldrin, (0.399 ug/g, dry weight basis) along with trace amounts of heptachlor epoxide (0.674 ug/g, dry weight basis) were detected in sediment sample S6SE1.

The data base for the soil samples from Site 6 shows low levels of chlordane were detected in Samples S6S10A, S6S10B, S6S11A, S6S12A, S6S15A, S6S15B, and S6S16A. The concentrations range from 2.85 to 41.0 ug/g, dry weight basis. In addition, low levels (less than or equal to 0.883 ug/g, dry weight basis) of numerous pesticides (aldrin; DDD,PP′; heptachlor; heptachlor epoxide) were found in the composite soil samples. DDD,PP′ was detected in samples S6S10A, S6S11A and S6S12A; heptachlor epoxide was detected in S6S12A and S6S15A; heptachlor was detected in S6S15A, as was aldrin.

SITE 7, LEACHATE PONDING AREA

The available data for the Priority Pollutant scan of the surface water sample collected at Site 7 shows that total chromium, cadmium, nickel, zinc, BIS (2-ETH′ HEX′) PHTH, DI-N-OCTYL PHTHALATE, and BHC-D were detected. However, for the metals, only the nickel concentration (48.9 ug/L) exceeds the EPA water quality criterion of 13.4 ug/L for nickel. BIS (2-ETH′ HEX′) PHTH was found at a concentration of 9 ug/L, which is far below the EPA water quality criterion of 15 mg/L for this compound, and the DI-N-OCTYL PHTHALATE was only 0.7 ug/L. The concentration of BHC-D was 0.016 ug/L which slightly exceeds the EPA water quality criterion of 0.0092 ug/L for this compound.

The metals analyses for the sediment sample collected from this site do not indicate significant contamination. The available data base for the organic Priority Pollutants does not indicate the presence of any contamination.

The available data base for the ground water samples collected at Site 7 shows that the only toxic organic pollutant detected was BIS (2-ETH'HEX') PHTH. Traces of this compound were also found in both potable wells sampled (S7GW5 and S7GW6). However, significant levels of arsenic were found in both potable ground water samples S7GW5 and S7GW6, at concentrations of 26.3 and 22.6 ug/L, respectively. These concentrations far exceed the EPA water quality criterion of 0.0022 ug/L.